the views of various authors, sandwiched among which are a few views of the author. The doctor considers that recovery is possible in a few cases of the less advanced degrees of the disease. The average given by him has been much the same as that of other authors. He has seen cases last as long as ten years, a duration which has sometimes been met with on this side of the water. Chapter five, on diagnosis, gives a good summary of the points of differential diagnosis, without adding any thing new. The discussion of the causes in the sixth chapter is not clear. The author objects, and on very good ground, to the sexual excess theory. He very properly lays great stress on mental overstrain and emotional disturbance. Taking the latter in its widest sense it may be said to be the great cause of progressive paresis. The morbid anatomy given by the author in the seventh chapter is chiefly coincidental, but not characteristic of progressive paresis. He, however, mentions the hemorrhagic condition of the stomach and intestines, which is so frequently a concomitant of the disease. The same may be said of the microscopical part of the chapter. The sections on pathological physiology contain nothing that is new, and but little that is well digested. The author says almost nothing, except in an indirect way, about trophic changes in the disease. The second part, chapters ten and eleven, chiefly consist of attempts at demarcation of varieties of progressive paresis. The histories, however, scarcely seem complete enough to justify these divisions, and the cases are by no means clearly demarcated from each other. Taking the book as a whole it cannot be said to be well digested; the author should have waited for some years before publishing it. The material he has accumulated is valuable, but with the present specimen one may well be inclined to doubt his power of analysis. For one who is able to pick out detached facts the book is of value. It bears the evidence of great haste, and as the author's powers of observation are such as have enabled him to secure much that is very valuable, it will serve as a useful supplement to that of Voisin; it is in many respects superior to that of Mendel. J. G. KIERNAN.

**Processes of excitation and inhibition in the motor brain-centres.** The above is the title of a paper of fundamental importance, by BUBNOFF and Prof. HEIDENHAIN, in *Pflüger's Archiv*, vol. xxvi, p. 137.

It opens to our view the nature of some hitherto unknown processes in nerve centres, and paves the way for an explanation of many cerebral disorders, such as hysteria and hypnotism.

hain found that with the increase in the strength of the exciting current or the excitability of the cortex the height of the muscular contraction increases, while the time of reaction is diminished. Every stimulus leaves the cortex in a state of exalted irritability, disappearing in some seconds. Hence successive stimuli can be chosen feebler and feebler, and still be effective. Even those shocks not intense enough to produce muscular response augment the cortical excitability temporarily ; hence a series of faint shocks will give a result when a single shock of that strength fails. In fact, cortical excitation of any kind is followed by heightened irritability, so that peripheral irritation producing a reflex movement leaves the corresponding cortical centre more irritable.

On removing the gray surface the time of reaction is indeed shortened, but the height of the contraction is also increased, at least when the animal is in a state of calm morphia narcosis.

But on comparing different experiments it was found, after all, that the shortening of the time is really greater than corresponds to a similar augmentation of the contraction produced by more intense cortical stimulation. Moreover, the recorded muscular course is *shorter* when due to irritation of the centrum ovale than when produced by a single shock applied to the gray surface. *The process of excitation begins later and lasts longer in the nerve cells than in the white fibres* when the latter are stimulated directly. But this is true only when the morphia narcotizes the animal. When the dog is rendered *excitable by the drug the retardation of the time of contraction, due to overcoming the cortical inertia, is inappreciably small.* In some instances, of which the conditions are not fully known, a large dose of morphia has a contrary influence. The time of contraction is immensely retarded (once up to 0.17 second), and the contraction produced by cortical stimulation prolonged into a persistent contracture. In these cases the rôle of the gray surface can be most strikingly shown, for on its removal the stimulation of the white fibres leads to a much speedier and shorter contraction. But the most conclusive proof of the importance of the cortical layer is obtained in the deepest narcosis, when the cortex is entirely inexcitable, while the usual current applied to the subjacent white fibres produces a vigorous response.

The authors introduce into the article their experience on cortical epilepsy, which is often an undesirable complication of these experiments, especially when the brain is hyperæmic. The course of the attack is usually the following: The convulsion begins in the part the centre of which is irritated, the centre being, of course, on the other side of the brain. If it does not stop here, which it may, it spreads to the symmetrical muscles of the other side, then radiates to other parts of the original side, and finally involves the entire body. As Munk has shown, the attack can be stopped by immediate excision of the irritated centre, but not by its removal later on. This the authors corroborate, and add that by the early extirpation of some other cortical centre at the beginning of the attack, the corresponding muscular group remains exempt. In some cases they succeeded also in checking the spasm of the entire body by a speedy removal of the whole motor region of either side. In other cases this did not succeed. They infer that the change-producing epilepsy starts in the cortex, but involves later on also the subcortical ganglia. Albertoni has seen epilepsy started by irritation of the centrum ovale. This, Heidenhain confirms, but points out the important difference that in that case the spasm begins on the *same* side of the body, and not, as with cortical irritation, on the opposite half. In this case, the epilepsy is really due to irritation of the cortex of the other cerebral hemisphere, the irritation being conducted thither through the association fibres, for after bilateral extirpation of the cortex no epilepsy can be produced. The authors compare the origin of the epileptic convulsions to an increase of cortical excitability produced by excessive stimulation.

Excitability of the cortical centres can be considerably influenced by stimulation of the peripheral sensory nerves. It is sometimes increased, sometimes diminished thereby. Merely touching the pair decisively augments the excitability of the corresponding centre. In certain instances morphine causes, as above mentioned, a condition of the cerebrum in which a single stimulation is followed by contracture of the corresponding muscle. This may now be inhibited by faint peripheral electric irritation, and more strikingly so by blowing on the skin. The latter experience recalls vividly checking of the cataleptic state induced by hypnotism. A point of special interest was the observation that such contractures could be inhibited likewise by following *feebler* stimulation of the cortical centre itself, or even other parts of the cortex.

The authors, in discussing these results, explain them by assuming the occurrence of two kinds of processes in the cortical centres, viz., excitation and inhibition. The predominance of the kind of molecular change causing the one or the other accounts for the variability of the cortical excitability. Sensory impressions, as well as direct electric stimulation of the cortex, influence both processes, augmenting, as a rule, the one feeblest at the time. Thus, the depressed excitability in morphia narcosis is exalted by peripheral irritation or successive stimulation of the cortex, while inhibitory processes are started by the same procedures when morphia has previously heightened the cortical irritability.

They point out, finally, that the continuation of these experiments promises a clue for the phenomena of hypnotism in man.

## SHORTER NOTICES.

I. MANUAL OF HISTOLOGY. By Thomas E. Satterthwaite, M.D., in association with Drs. T. Dwight, J. Collins Warren, W. F. Whitney, Clarence J. Blake, C. H. Williams, H. C. Simes, B. F. Westbrook, E. C. Wendt, A. Mayer, R. W. Amidon, H. R. Robinson, W. R. Birdsall, D. Bryson Delavan, C. L. Dana, and W. H. Porter. W. Wood & Co., 1881.

II. LECTURES ON THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE CHEST, THROAT, AND NASAL CAVITIES. By E. Fletcher Ingals, A.M., M.D. W. Wood & Co., 1881.

III. INDIGESTION AND BILIOUSNESS. By J. Milner Fothergill, M.D. W. Wood & Co., 1881.

IV. A PRACTICAL TREATISE ON IMPOTENCE, STERILITY, AND ALLIED DISORDERS OF THE MALE SEXUAL ORGANS. By S. Gross, A.M., M.D. H. C. Lea's Son & Co., 1881.

V. LECTURES ON DIGESTION. An introduction to the clinical study of Diseases of the Digestive Organs. Twelve lectures. By Dr. C. A. Ewald. Translated by Robert Saundby, M.D. W. Wood & Co., 1881.

I. This handsome volume is intended to fill an intermediate position between the larger works like Stricker's, and the smaller guides for the microscope, designed for beginners. It is, we believe, the first American work of any scope on histology. It is well and plainly written, and deals with the subject in a commendable manner. It is of course but a compilation by men, practically familiar, however, with the subject. We cannot, however, grant the praise of absolute completeness, since many of the finer points are barely, if at all mentioned, while some important inves-